

Notice of Allowability

Application No.

10/669,013

Examiner

Rita Leykin

Applicant(s)

IMAI ET AL.

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to ____.
2. ☒ The allowed claim(s) is/are 1-4.
3. ☒ The drawings filed on 24 September 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

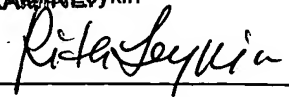
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 9/24/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date ____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____.

RITA LEYKIN primary examiner
PRIMARY EXAMINER



REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance. The prior art made of record in the attached form PTO-892 considered to be pertinent to the submitted application.

Iijima et al. US # 6,462,491 disclose a position sensorless motor control apparatus that is provided to achieve high accuracy angle estimation even in presence of phase voltage saturation. An angle estimating unit which generates estimated rotor comprises an estimating phase selecting unit for selecting an estimation phase designating the stator winding phase to be used for generation of the estimation angle. And deviation generating unit for generating a phase voltage value based on estimated angle and phase voltage value. An angle correcting unit for correcting the estimated angle so that the deviation converges to zero. And an estimated coefficient value correcting unit for an estimated coefficient value which is the estimated value of a coefficient in the phase voltage equation.

Konecny US# 6,157,150 teaches a brushless sensorless dc motor assembly with precisely controllable positioning. Wherein, the brushless dc motor assembly computes rotor position by examining the current measurements of the stator windings. The dc motor assembly includes a rotor and a set of stator windings that are adapted to drive the rotor. A power amplifier is adapted to apply voltage to each stator winding in sequence according to a received sequence of switching signals. A current sensing assembly permits the determination of the current through each stator coil to produce a sequence of stator coil current values over time. A data processor is adapted to

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calculate the sequence of switching signals based on the received commanded rotor position and computed rotor position. The calculation of the computed rotor position is based on the most recent set of stator coil current values and the most recent set of computed switching signals.

However, none of the prior art teaches or suggest in combination:

- Calculating a sine reference value which corresponds to a sine value of an angle which is twice a phase difference ($\Theta - \Theta'$) between an actual value (Θ) and estimated value (Θ') of the rotor angle of the motor and a cosine reference value which corresponds to a cosine value of the angle which is twice the phase difference ($\Theta - \Theta'$) based on variations of the d axis actual current and the q axis actual current and levels of the d axis voltage and the q axis voltage in a control cycle in which the unidirectional feedback control is implemented to each of the two or more directions.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rita Leykin whose telephone number is (571)272-2066. The examiner can normally be reached on Monday-Friday 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571)272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rita Leykin
Primary Examiner
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A handwritten signature in black ink that reads "Rita Leykin". The signature is written in a cursive style with a large, stylized "R" and "L".

R.L.